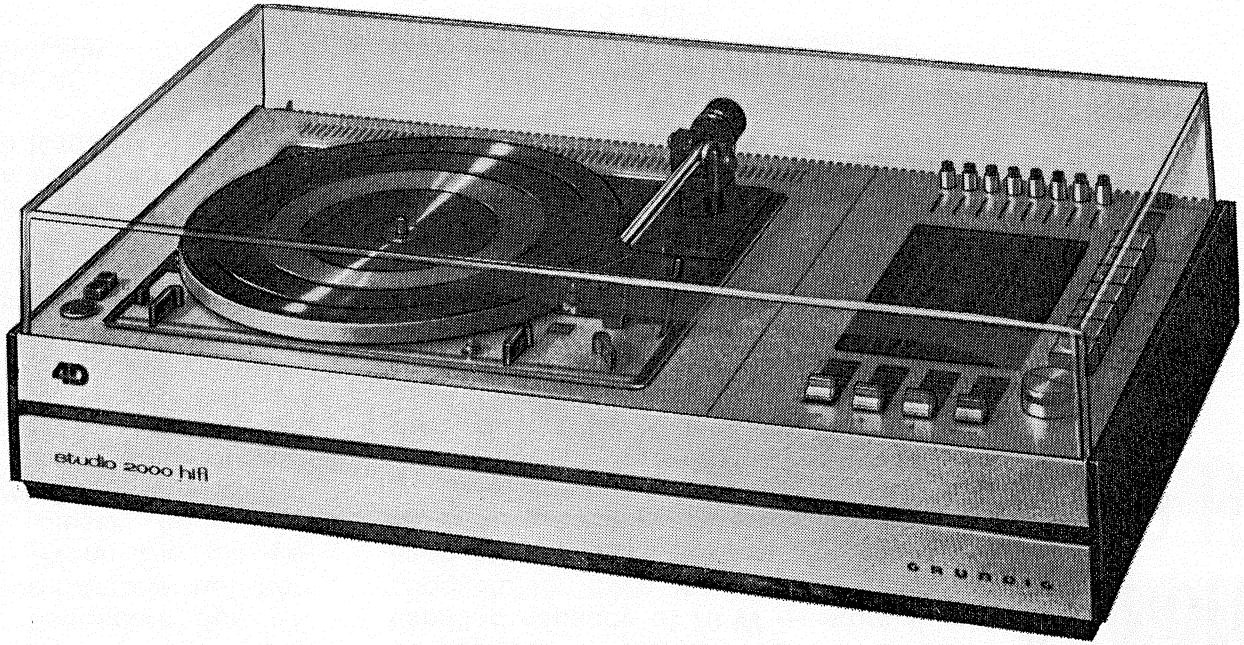
GRUNDIG

Studio 2000 b



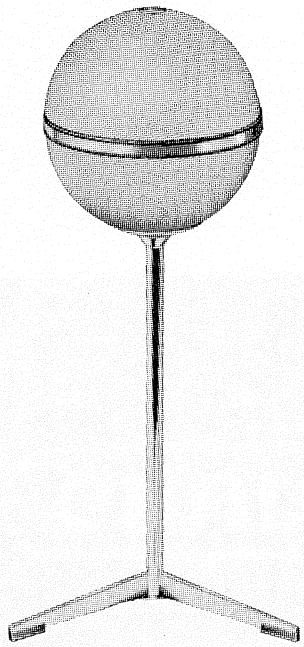
4D STEREO

GRUNDIG

Audiorama 7000 HiFi

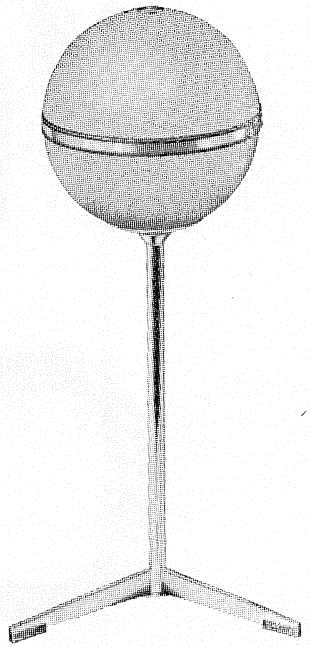
70-Watt-Lautsprecherboxen, die jeden Rahmen sprengen, besonders den der relativ engen Stereo-Hörzone bei herkömmlichen Boxen. Wenn Sie die gewaltige Klangfülle dieser Audiorama-Strahler erleben, werden Sie alles Bisherige vergessen. 12 hochwertige Lautsprecher je Kugel, davon 4 Tieftöner und 8 Hochtöner, strahlen den Schall rundum in alle Richtungen ab. Die Klangwirkung ist faszinierend. Dabei bleiben die Lautsprecher selbst gleichsam „akustisch unsichtbar". Eine Folge der einzigartigen Rundum-Charakteristik. Die Audiorama-Strahler lassen sich überall aufstellen oder aufhängen. Ein elegantes Fußgestell und eine dekorative Kette werden mitgeliefert.
Übertragungsbereich: 45 . . . 20 000 Hz,
Farbe schwarz oder weiß,
Durchmesser: 31 cm

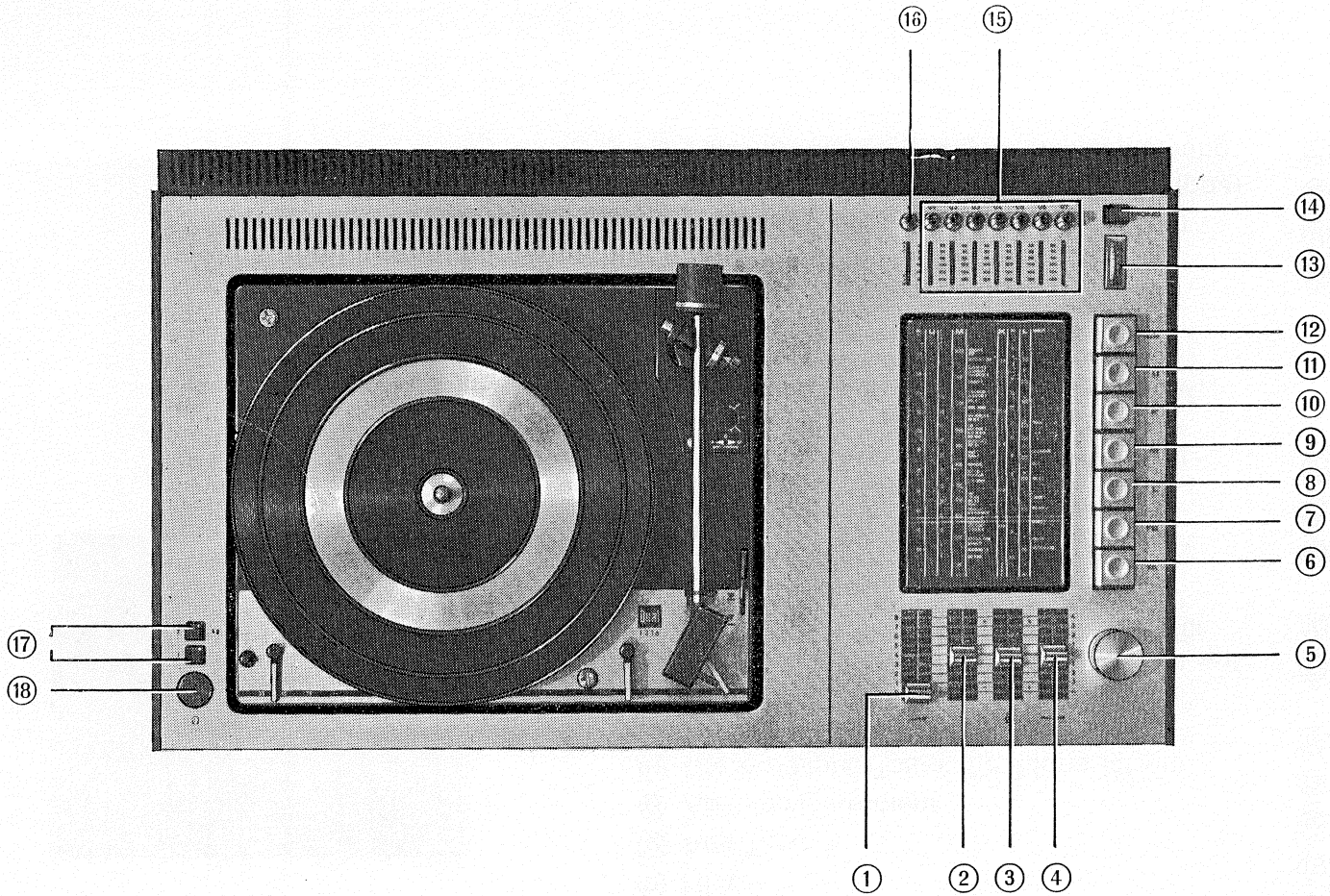
Loudspeaker systems with a power handling capacity of 70 W — more than adequate for even the most demanding applications. You are no longer confined to a small zone of good stereo listening as in conventional systems.
The audiorama units are so powerful that they over-shadow anything else you have heard in the past. Each sphere contains 12 highly efficient loudspeaker systems. 4 of these are bass and mid-range units, 8 are treble tweeters.
Sound radiation is fully omni-directional, leaving the speakers as such acoustically invisible.
Audiorama units are supplied complete with a decorative chain and elegant floor stand to give a choice of support and to simplify installation.
Frequency Range: 45 . . . 20.000 Hz
Colour: Black or white
Diameter: 31 cm



L'immense ampleur sonore de ces diffuseurs AUDIORAMA vous fera oublier tout ce que vous avec pu entendre jusqu'à présent. Douze haut-parleurs par sphère, dont 4 pour les graves et 8 pour les médiumsaiguës, assurent une diffusion dans toutes les directions, engendrant ainsi un effet sonore fascinant. L'impression stéréophonique est nettement perceptible; vous distinguerez avec précision le timbre naturel des différents instruments, les haut-parleurs proprement dits restant pour ainsi dire "acoustiquement invisibles". Une conséquence de leur caractéristique omnidirectionnelle unique: les diffuseurs AUDIORAMA peuvent être posés ou suspendus partout, chaque sphère étant livrée avec un élégant piètement et une chaîne décorative.
Bande passante: 45 . . . 20.000 Hz
Coloris: noir ou blanc
Diamètre: 31 cm

Box di altoparlanti da 70 Watt che ampliano acusticamente ogni ambiente in particolare il campo d'ascolto creato fin'ora dai box normali. La pienezza di suono di questi irradiatori crea nuove sensazioni d'ascolto. 12 altoparlanti per sfera (4 per toni bassi e 8 per toni alti) irradiano il suono ovunque riempiendo talmente il locale da rendere gli altoparlanti «acusticamente invisibili». Gli irradiatori Audiorama possono essere collocati o appesi ovunque. L'imballo contiene oltre alla sfera, anche un'elegante catena ed un supporto esteticamente molto valido.
Risposta in frequenza: 45 . . . 20000 Hz
Colore: nero o bianco
Diametro: 31 cm



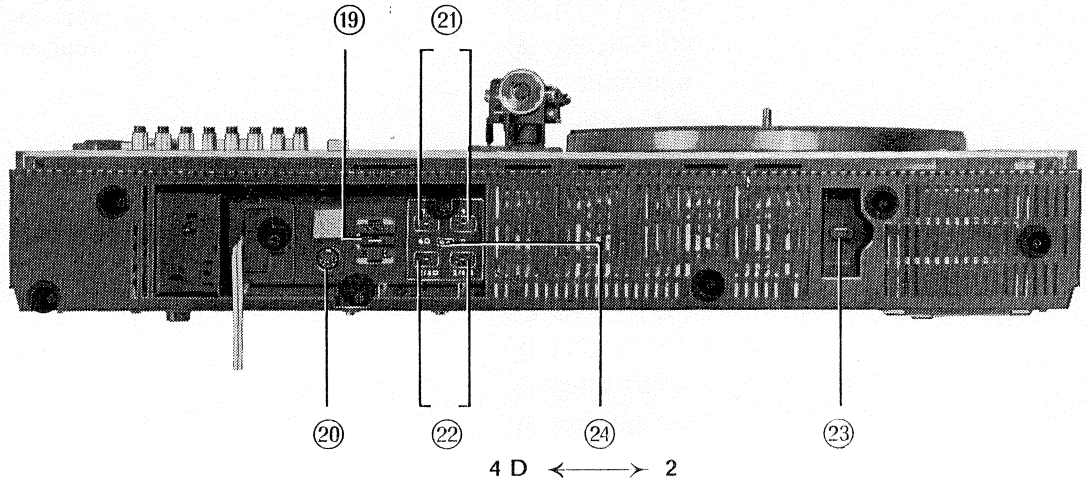


Für die Bedienung des Plattenspielers liegt eine gesonderte Anleitung bei.

Separate operating instructions are supplied for the record player.

Une notice d'emploi est jointe pour le tourne disques.

Le istruzioni per il giradischi sono descritte a parte.



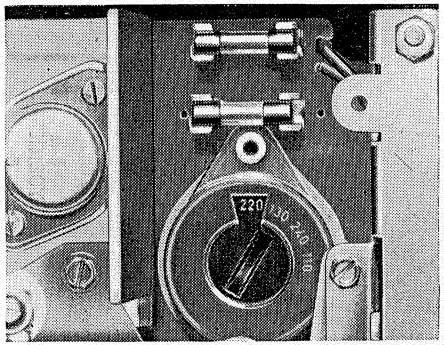
● Diese Schrauben zur Abnahme der Rückwand entfernen

● To remove rear panel, remove these screws

● Défaire ces vis avant d'enlever le panneau arrière

● Allentare queste viti per togliere il pannello posteriore.

Spannungswähler
Voltage Selector
Sélecteur de tension



① Lautstärke
② Baßregler
③ Höhenregler
④ Stereo-Balance
⑤ Senderwahl
⑥ TA-Taste (zu drücken bei Wiedergabe mit dem eingebauten Plattenspieler)
⑦ TB-Taste (zu drücken bei Tonband-wiedergabe)
⑧ Langwelle
⑨ Mittelwelle
⑩ Kurzwelle
⑪ UKW
⑫ Aus-Taste
⑬ Abstimminstrument
⑭ Stereo/Mono-Taste (für Mono ist die Taste zu drücken)
⑮ UKW-Programmtasten
⑯ Kleine U-Taste für UKW-Senderwahl auf Hauptskala; drehbarer Rändelknopf für UKW-Automatik (AFC)
⑰ Gruppenschalter für Lautsprecher
⑱ Stereo-Kopfhörerbuchse
⑲ Anschlüsse für Antennen und Erde: Die beiden oberen Buchsen für UKW-Dipol (240 Ohm); die linke untere für Außenantenne der AM-Bereiche (L, M, K); die rechte untere Buchse für Erdung. Zwischen den Buchsen Antennen-Trennstelle (Drahtbügel)
⑳ Tonband-Buchse
㉑ Lautsprecherbuchsen (grüne Gruppe)
㉒ Lautsprecherbuchsen (schwarze Gruppe)
㉓ Anzeige der eingestellten Netzspannung

① Volume Control
② Bass Control
③ Treble Control
④ Stereo Balance
⑤ Tuning
⑥ Phono Button (to depress for playback with the built-in record player)
⑦ Tape Button (to depress for playback of tapes)
⑧ LW (Long Wave)
⑨ MW (Medium Wave)
⑩ SW (Short Wave)
⑪ FM
⑫ Off Button
⑬ Tuning Meter
⑭ Stereo/Mono button (to depress if mono reproduction is desired)
⑮ FM Pre-selection Buttons
⑯ Press this button for FM tuning on main scale, turn it to switch on/off AFC
⑰ Speaker Group Switch
⑱ Stereo Earphone Socket
⑲ Antenna/Earth Connecting Sockets: top sockets for FM dipole (240 Ω), lower left socket for AM antenna (LW, MW, SW), lower right socket for earth connection. Antenna separating bridge between the sockets.
⑳ Tape Recorder Socket
㉑ Loudspeaker Sockets (green group)
㉒ Laudspeaker Sockets (black group)
㉓ Indication of adjusted mains voltage

① Réglage de puissance
② Réglage des graves
③ Réglage des aigüs
④ Balance stéréo
⑤ Recherche des émetteurs
⑥ Touche PU (à enfoncer pour la lecture de disques
⑦ Touche magnéto (à enfoncer pour la lecture de bandes magnétiques)
⑧ GO (grandes ondes)
⑨ PO (petites ondes)
⑩ OC (ondes courtes)
⑪ FM
⑫ Touche "Arrêt"
⑬ Vu-mètre d'accord
⑭ Touche stéréo/mono (à enfoncer pour reproduction en mono)
⑮ Touches programme FM
⑯ Tourner cette touche pour commuter l'AFC; l'enfoncer pour l'accord FM sur le cadran FM principal
⑰ Commutateur de groupes HP
⑱ Prise casque stéréo
⑲ Connexions antennes/terre:
Prises supérieures pour le raccordement d'une antenne FM (240 Ω), prise inférieure gauche pour antenne AM (GO, PO et OC), prise inférieure droite pour mise à la terre.
Bouche de séparation antenne entre les prises
⑳ Prise magnéto
㉑ Prises HP (groupe vert)
㉒ Prises HP (groupe noir)
㉓ Indication tension secteur

① Regolatore di volume
② Regolatore toni bassi
③ Regolatore toni alti
④ Bilanciamento stereo
⑤ Sintonia
⑥ Tasto phono (da premere per la riproduzione tramite il giradischi incorporato)
⑦ Tasto registratore (da premere per la riproduzione di nastri)
⑧ Onde Lunghe
⑨ Onde Medie
⑩ Onde Corte
⑪ FM (modulazione di frequenza)
⑫ Tasto di spegnimento
⑬ Strumento di sintonia
⑭ Tasto Stereo/Mono (va premuto per la riproduzione mono)
⑮ Tasti per la pre-sintonizzazione FM
⑯ Piccolo tasto "U" per la sintonizzazione di stazioni FM sulla grande scala; ruotandolo commuta la sintonia automatica FM (AFC)
⑰ Commutatori per i gruppi di altoparlanti
⑱ Presa per cuffia stereo
⑲ Prese di collegamento per antenne e terra. Ambedue le prese superiori servono per il collegamento di un dipolo FM (240 Ohm), la presa inferiore di sinistra per l'antenna AM (OL, OM, OK), la presa inferiore di destra serve per il collegamento di terra. Il punto di separazione antenne (ponticello) si trova tra le prese.
⑳ Presa registratore
㉑ Prese altoparlanti (gruppo verde)
㉒ Prese altoparlanti (gruppo nero)
㉓ Indicatore della tensione di rete

Ausgänge
Zweimal für jeden Kanal eine Lautsprecher-Buchse nach DIN 41529. Nennabschlußwiderstand 4 Ω (min. 3 Ω). Es können Lautsprecher mit größerer Impedanz bei entsprechend geringerer Ausgangsleistung angeschlossen werden. Die Lautsprecherausgänge sind durch automatische Kurzschlußsicherungen geschützt (siehe entsprechende Kurve). Kopfhörerbuchse nach DIN 45327 für 5 — 2000 Ω Hörer.

Überlastschutz
Elektronische Automatik schaltet in allen Fällen von Überlastungen, also nicht nur bei Kurzschlüssen, den jeweils gestörten Kanal ab. Auch kapazitive oder induktive Überlast wird von der Automatik sicher „erkannt". Die Endtransistoren sind damit vor Zerstörung geschützt. Nach Beendigung der auslösenden Störung wird das Gerät selbsttätig wieder eingeschaltet.

Schalter und Regler

Baßregler
Regelbereich von —20 dB Absenkung bis zu +13 dB Anhebung bei 40 Hz; unsymmetrischer Regelbereich. Unabhängig von der Stellung des Lautstärkereglers

Höhenregler
Regelbereich von —20 dB Absenkung bis +12 dB Anhebung bei 16 kHz; unsymmetrischer Regelbereich. Unabhängig von der Stellung des Lautstärkereglers

Lautstärkeregler
Physiologische Lautstärkereglung. Durch 2-fach beschalteten Regler werden bei kleinen Lautstärken die Bässe angehoben.

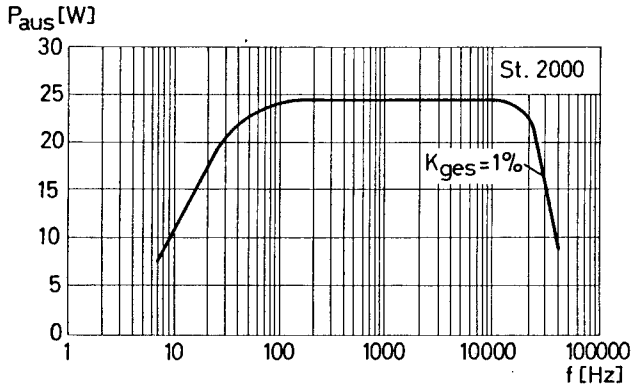
Balanceregler
Regelumfang —9 bis +3,5 dB. Die Gesamtlautstärke bleibt dadurch in weitem Bereich konstant

Stromversorgung
Für Netze von 110/130/220/240 Volt 50/60 Hz
Leistungsaufnahme 110 Watt bei 2 x 22,5 Watt Ausgangsleistung, Leerlauf ca. 20 Watt, Plattenspieler max. 10 Watt.

Gehäuseabmessungen
ca. 65 x 18 x 39 cm

Änderungen vorbehalten!

Die Kurven zeigen den typischen Verlauf
Typical curves
Courbes typiques
Curve caratteristiche

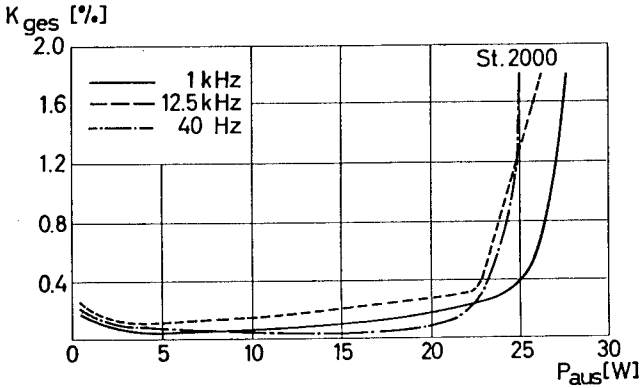


Leistungsbandbreite

Power band width

Courbe de réponse effective

Curva di risposta

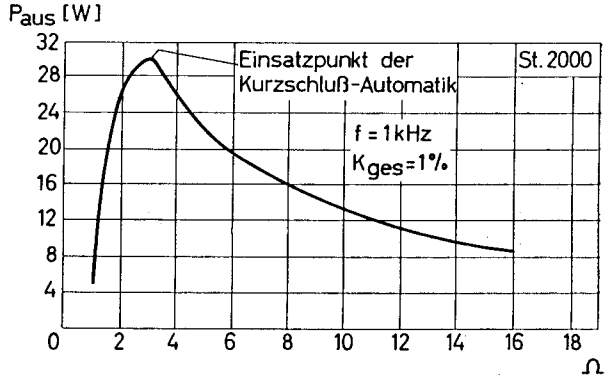


Klirrfaktorkurven

Harmonic distortion

Taux de distorsion

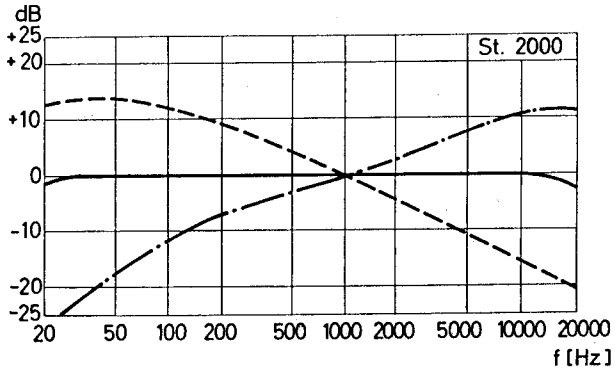
Fattore di distersione



Ausgangsleistung bei verschiedenen Abschlußwiderständen

Output power as a function of load resistance
Puissance de sortie en fonction de la résistance de charge

Potenza d'uscita in funzione della resistenza di carico



Wirkungsbereiche der Klangregler
Effective range of tone controls
Plages d'action des réglages de tonalité
Campo d'azione dei regolatori di tono

Operating Instructions

Mains Voltage Adjustment

The mains voltage to which the Studio 2000 is adjusted is indicated in a small window on rear panel ㉓. After having removed rear panel (unscrew 8 screws), the voltage selector and the mains fuse are accessible at the place of the window (see illustration page 3).

Attention! Always disconnect the set from the mains supply before removing rear panel.

Adjust the desired mains voltage by turning the voltage selector disc by means of a screw driver. Make sure a proper mains fuse (fuse "I", above selector disc) is fitted. Use a fuse of 1.25 A SB for the voltage range of 110–130 V and a fuse of 630 mA SB for the range of 220–240 V.

Further fuses are fitted into the circuitry of the set but should only be exchanged by a trained technician.
Do not use repaired or fuses of higher current ratings as to prevent damage of the set.

The built-in record player is automatically set to the correct operating voltage.

Loudspeaker and Earphone Connection

In order to gain full advantage of the high reproduction quality and power of the Studio 2000, only speaker systems with corresponding power handling capacity and impedance must be used.
Your Studio 2000 is provided with 4 connecting sockets (㉑,㉒) for connection of two separate stereo loudspeaker groups which allow stereo reproduction in two different rooms or "4D-stereo" reproduction in one room (see paragraph "4D-Stereo"). The socket ⑱ on front of the Studio 2000 is provided for the connection of a stereo earphone.
The "group switch" ⑰ (consisting of the keys "1" and "2/4D") permits to operate the connected speaker groups and the earphone in following combinations:

- Speaker group "1" (plus earphone)
- Speaker group "2" (plus earphone)
- Speaker groups "1"+"2" (plus earphone) or "4D-Stereo"
- Earphone on, speaker groups off.

The key 1 permits to switch on and off the speaker group which is connected to the green speaker sockets. The key 2 serves for switching on and off the speaker group connected to the black sockets. Pressing the keys switches the speaker groups on. To release the keys, press again. If both keys are released, you can listen only through the connected earphone (we recommend to use the GRUNDIG earphones type 2115, 215 or 220).
Please ensure that the speakers of one stereo speaker group are always connected to sockets of same colour (black or green), otherwise no stereo effect is obtained. Also make sure that the speakers are connected to the appropriate channel (R = right channel, L = left channel).
Hint: Loudspeaker extension cords can be ordered under the order numbers 375 (5 m length) or 376 (10 m length).

Antenna Connections

The sockets for an AM outdoor antenna (⅄), ground lead (⏚) and FM antenna (⊓) can be found in the rear of your set.
In most cases a great number of FM stations can be received with a simple indoor FM dipole antenna (f. ex. the GRUNDIG FM furniture antenna). High demand for reception and playback however can only be accomplished with an efficient outdoor antenna. Here the old saying holds true: "A good antenna cannot be replaced by an RF stage". This is true for FM mono reception, but even more so for FM stereo. In difficult reception areas noise-free stereo reception can only be accomplished by using an efficient outdoor FM Dipole antenna. This antenna should face the transmitting station and will in addition improve the reception on all bands especially shortwave.

AM stations can also be received with the FM Dipole without changing the antenna socket, for the set is equipped with an interconnection. The antenna socket to the lower left (Y) is a high-inductive input for a single wire outdoor antenna for AM reception. The ground connection is made to the socket ⏚ (recommended for SW reception). If two different antennas for FM and AM are used, the wire link between the antenna sockets has to be removed to avoid unwanted interference. Any additional information can be supplied by your dealer. All plugs and accessories needed are available.

Note:

Your Studio 2000 is fitted with new flat-pin antenna / ground input sockets.

Switching On and Off

The Studio 2000 is switched on by pressing one of the following buttons:

TA = playback of records
TB = playback of tapes
L = Long Wave Band
M = AM Band (MW)
K = Short Wave Band
U = FM Band

Do not forget to press the corresponding key of the speaker group switch ⑰.

At FM reception in addition one of the small buttons marked U — U 7 must be pressed. To switch off, press button ⑫.

Volume Setting

Adjust the volume with the slider control ①. Pushing the control upwards increases the volume.

Station Tuning

Use the large control knob ⑤ to tune in to the station you require. The built-in flywheel tuning allows you to move the pointer across the scale quite quickly and ensures rapid and troublefree precise station tuning. Observe the tuning meter ⑬ on the top right of the scale when tuning in to a station. You must aim for the maximum possible pointer deflection which indicates that the station is accurately tuned.

Stereo Radio Reception

Your Studio 2000 contains an FM multiplex stereo decoder to receive FM stereo transmissions. The decoder is fitted with an automatic switch and it can distinguish between stereo and mono reception. For this reason we suggest that you leave your Studio 2000 always set to "Stereo" (mono/stereo button ⑭ released). The decoder will then automatically select the correct method of reception and the red mono/stereo button will light up as soon as a stereo programme is received. If you would still like to receive this in mono (perhaps to record with a mono tape recorder or if the stereo signal is too weak for high quality reproduction) simply press the mono/stereo button ⑭.

Tone Control

It consists of two controls: ② (bass) and ③ (treble). The bass control increases the bass tones (tuba) when pushing it upwards. The treble control adjusts the intensity of the treble tones (violin). To eliminate hissing tones, push the control downwards.

FM Preset Memory Tuning

At the top of the dial, 7 FM preselectors ⑮ (U 1 — U 7) are provided, each with its individual dial.
To tune to a station on anyone of these, rotate their small knurled tuning controls. To play the selected station depress the small chrome center button of the corresponding control. To preset an FM station on the memory tuning follow these steps:

- Press preset button (U 1 — U 7) above the desired dial scale plus the large waveband selection button "U" ⑪.
- Switch off AFC by turning the small knurled knob U to the extreme left.
- Turn knurled knob on selected preset button to the desired station on the individual dial scale. Tune in to maximum pointer deflection on tuning-meter.
- Switch on AFC by turning knurled knob U to the right.

Automatic Frequency Control on FM (AFC)

The automatic frequency control is in operation when the knurled control of the small knob U is turned all the way to the right. It locks in a station once it is tuned in. When tuning in a different FM station switch off the AFC by turning the same control all the way to the left. Do not use the automatic frequency control to receive a weak station close to a much stronger one otherwise the receiver will lock onto the stronger station of the two with the automatic frequency control in operation.

Stereo Balance

To achieve an optimum stereo effect, use control ④ to equalize the sound levels from both speaker systems. If the left and right channel is exactly balanced, you will hear equal sound levels from the left and right speaker. If, however, there is an imbalance caused by room acoustics, you can adjust the sound levels by pushing the balance control either upwards (right speaker) or downwards (left speaker).

Record Reproduction

The record player fitted to your Studio 2000 will handle all the usual mono and stereo records. It is already connected to the appropriate socket of the radio chassis and a separate instruction book is provided. To play records, press the button TA. If you are playing stereo records, then the mono/stereo button ⑭ must be released. (If it should be depressed, release it by pressing once more). A second record player with crystal or ceramic pick-up, can be connected to socket "TB" ⑳. In this case the button "TB" must be depressed for playback.

Tape Recorder Connection

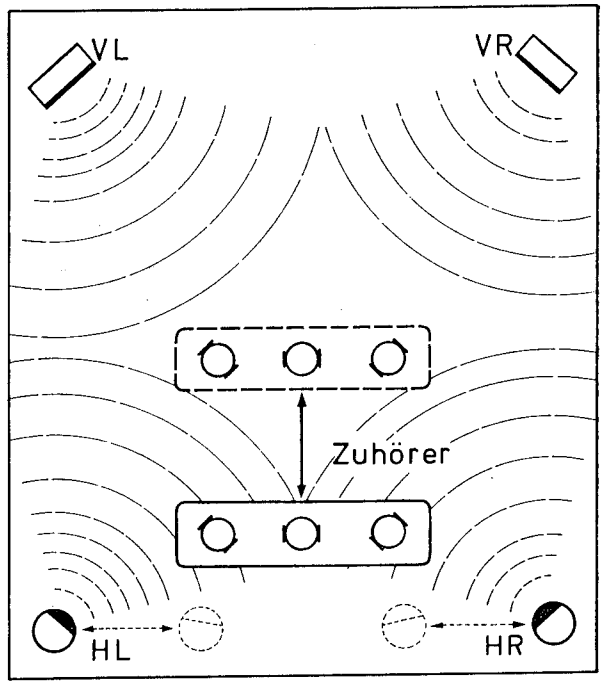
To record from your radiogram or to play back through your radiogram, connect the tape recorder to the socket marked TB. If you are using a lead fitted with two 5-pin plugs and if your tape recorder is fitted with the appropriate socket, then you can record from your radiogram and play back through it without changing leads or sockets. At reproduction press button TB. In the case of stereo recordings or playback, leave the button ⑭ in its rest position.

GRUNDIG 4D – Stereo

For "4D" stereo reproduction four loudspeaker systems (two stereo speaker groups) which are installed in the same room must be connected to the Studio 2000. One of the two speaker groups must be installed in front of the listener (front speakers) whereas the other group must be installed in the rear of the listener but in the same level as the front speakers.
The front speakers must be connected to the sockets "1" (position ㉑), the rear speakers to the sockets "2/4D" (position ㉒). The switch ㉔ which is situated between the speaker sockets must be set to position "4D". Please ensure that the speakers are connected to the correct (left or right) channel (see illustration).

On the front of the Studio 2000 the buttons "1" and "2/4D" of the speaker group switch ⑰ must be pressed. The button "4D" permits to switch on and off the "4D" stereo effect.

For 4D-stereo reception we recommend to use four loudspeakers type "Box 303" or "Box 306". As rear speaker group you can also use two speakers type "Box 210". The GRUNDIG Twin Bass Speaker with Omni-Directional Stereo Speakers is not suitable for 4D reproduction.



Example for installing four speaker systems at 4D-reproduction

VL = front left speaker system
VR = front right speaker system
HL = rear left speaker system
HR = rear right speaker system
Zuhörer = listeners

Attention!

As the loudspeakers "Box 210" have a power handling capacity of 20 W only, they must only be connected when the switch ㉔ between the speaker sockets is set to position "4D". For this reason, **never forget** to set the switch to this position before connecting these loudspeakers.

Technical Data

Transistors and Diodes
38 transistors, 4 of them silicon output transistors
Mixer stage equipped with 2 Mesa transistors
30 diodes, 3 rectifiers

RF Stages and Decoder
FM Band: 87.5 to 108 MHz

AM Band
LW: 145—350 kHz = 2050—860 m
MW: 510—1620 kHz = 587—185 m
SW: 5.4—16.2 kHz = 55.6—18.5 m

The following data are measured acc. to DIN 45500 if not otherwise indicated

Sensitivity
FM: 3.4 µV 240 Ω (1.7 µV / 60 Ω)
for 15 kHz deviation and signal-to-noise ratio of 26 dB

AM:
MW: 20—25µV
LW: 25—28.5 µV $\frac{N + S}{N} = 6$ dB
SW: 4—5 µV m = 30%

IF Rejection
FM: better than 60 dB
AM: better than 55 dB

Image Suppression
FM: 28—30 dB
AM: MW: 37—39 dB
LW: 37—42 dB
SW: 15—20 dB

Capture Ratio
3 dB at —30 dB distortion, 100 µV — 1 mV antenna voltage and 40 kHz deviation

Band Width
IF at FM: 200 kHz
IF at AM: 5.8 kHz
FM ration detector: ≧ 800 kHz, wide band filter with phase compensation

AM Suppression
Better than 55 dB at 1 kHz, measured at 22.5 kHz deviation, 30% AM modulation and 1 mV / 240 Ω input signal

IF Frequencies
FM: 10.7 MHz AM: 460 kHz

Drift
1 kHz per centigrade, compensated by automatic fine tuning

Automatic Fine Tuning at FM
Switchable, pull-in range ± 250 kHz

Circuits
FM: 13 + 2 (2 of them tunable)
AM: 7 + 1(2 of them tunable)

Signal/Noise Ratio (weighted)
(at speaker for 2 x 50 mW acc. to DIN 45405 in the range of 31.5 Hz — 15 kHz)
≧ 55 dB at Mono, ≧ 55 dB at Stereo

Signal/Noise Ratio (unweighted)
(at speaker for 2 x 50 mW acc. to DIN 45405 in the range of 31.5 Hz — 15 kHz)
≧ 60 dB at Mono, ≧ 55 dB at Stereo

Pilot Tone and Subcarrier Suppression
(at 47 kΩ II 250 pF)
—40 dB at 19 kHz
—60 dB at 38 kHz

Deemphasis
50 µsec

Distortion Factor of the FM Receiver
0.7% at 1 mV antenna voltage and 1 kHz modulation, measured at nominal output

Frequency Response
40—50 Hz ± 1 dB
50—6300 Hz ± 1.5 dB
6300 — 15 000 Hz ± 2.5 dB
from input to speaker output acc. to DIN 45500.

Stereo Separation
1 mV antenna voltage, 47.5 kHz deviation
250 Hz—6300 Hz ≧ 24 dB
6300 Hz—10 000 Hz ≧ 20 dB
at 1000 Hz: at least 35 dB

AF Stage
Output Power
2 x 35 Watt music power, 2 x 22.5 Watt r.m.s. power at 4 Ω load and simultaneous drive of both channels

Distortion Factor
Less than 0,5% at nominal output and simultaneous drive of both channels of one speaker group

Power Band Width
20—20 000 Hz at 1% distortion

Intermodulation Distortion
Less than 0.5%, measured at full modulation with 250 and 8000 Hz mixed in a ration of 4:1

Audio Frequency Response
40—16 000 Hz ± 1.5 dB at TR/PU-crystal
(at full volume)

Cross Talk Attenuation
1000 Hz ≧ 45 dB
250—10 000 Hz ≧ 38 dB
16 000 Hz ≧ 40 dB

Damping Factor
Due to the low output impedance of 0.2 Ω, a damping factor of 26 dB at 4 Ω load is obtained

Signal/Noise Ratio (unweighted)
(accord to DIN 45405 in the range of 31.5 Hz—20 kHz)
at 22.5 W nominal power:
80 dB at tape input and 0.5 V input voltage,
at 50 mW output power:
58 dB at tape input

Antennas
FM: FM-dipole 240 Ω
AM: outdoor antenna and ground
Ferrite Antenna

Inputs
Sensitivity value referred to 22.5 W nominal output
Phono-magnet: 1.5 mV at 47 kΩ
Tape/Phono-crystal: 200 mV at ≧ 0.5 MΩ
The input Phono-magnet is provided with an equalizer according to DIN Standard
(time constants: 3180—318—75 µsec)

Maximum Input Voltages
Tape/Phono-crystal: 5 V

Outputs
Two speaker sockets (accord. to DIN 41529) for each channel. Nominal charging resistance 4 Ω (min. 3 Ω). Laudspeakers of higher impedances may be connected, resulting however in loss of output power. The speaker outputs are automatically protected against short circuit.
An earphone socket according to DIN 45327 for earphones with an impedance of 5—2000 Ω.

Circuit Breaker
protects against shorts and circuit overloads. The set will re-connect itself as soon as the fault conditions have been removed

Controls:
Bass Control
The range of this control is from —20 dB to +13 dB at 40 Hz, undependantly of volume control position

Treble Control
The range of this control is from —20 dB to +12 dB at 16 kHz, undependantly of volume control position

Volume Control
Bass accentuation at low listening levels.

Balance Control
Range +3.5 to —9 dB. Total volume rests constant

Stereo/Mono
Push-button-controlled

Power Requirements
The GRUNDIG studio 2000 operates on 110/130/220/240 Volts, 50—60 Hz and consumes 110 W at 2 x 22,5 W nominal output. No-load 20 W. Record player 10 W.

Dimensions
approx. 65 x 18 x 39 cm

Note: See also illustrations on page 11

Alterations reserved

Lautsprecher für den Selbsteinbau

Für diejenigen, welche die Lautsprecher selbst montieren oder einbauen wollen, stehen GRUNDIG Lautsprecherkombinationen zur Auswahl. Genaue Bauanleitungen liegen den Lautsprechersätzen bei.
Die lieferbaren GRUNDIG Lautsprecher und Lautsprecher-Kombinationen sind bereits mit den notwendigen Anschlußkabeln und Steckern ausgerüstet. Um jedoch auch bei anderen Lautsprechern die richtige Polung sicherzustellen, empfiehlt es sich, zweifarbige Litze zu verwenden. Bei beiden Lautsprecherbuchsen liegt der Massepol jeweils am Mittelanschluß, so daß der gleichphasige Anschluß aller Lautsprecher bei der Installation mühelos hergestellt werden kann.

Achtung! Der Anschluß von Lautsprechern oder Lautsprecher-Kombinationen, deren Gesamtimpedanz 3 Ω pro Kanal unterschreitet, ist zu vermeiden.

Zur Beachtung:

Beim Verlegen langer Lautsprecherleitungen können Brummstörungen auftreten, verursacht durch freiliegende Netzkabel, Verlängerungskabel oder sonstige parallel-laufende Netzleitungen, besonders in Gebäuden mit Stromversorgung über Freileitungen.
Als Abhilfe empfiehlt sich ein ausreichender Erdanschluß des Gerätes (z. B. leitende Verbindung der Erdungsbuchse ⏚ mit Wasserleitungsrohren oder der Zentralheizung). Lautsprecher- und Netzleitungen unter oder auf Putz weit voneinander verlegen (z. B. nicht zusammen in einem Rohr).

Self-Installation of Speakers

For self-installation GRUNDIG offers speaker kits which are accompanied by exact mounting instructions. All GRUNDIG speaker systems are provided with the necessary connection leads and plugs. For speakers of other makes we recommend to use two-coloured strands to ensure correct phasing. The ground connection at both loudspeaker sockets can be found at the center of each socket. All speakers can thus be connected in identical phase.

Important! The connection of speakers or speaker systems with a total impedance of less than 3 Ω per channel is not permissible.

Notice:

Hum distortion may be encountered when laying loudspeaker cables with excessive lenght due to exposed mains cords, extension cords, etc., especially in buildings with overhead power supply. A good connection to ground is a remedy in this case (connection of the ground socket to a water pipe or radiator) or laying of speaker cables and power lines separate from each other under plaster.

Haut-parleurs nus

A l'intention de ceux qui désirent monter ou incorporer eux-mêmes les haut-parleurs à l'endroit voulu GRUNDIG propose un important choix de HP nus mais entièrement câbles. Les instructions de montage sont jointes à chaque ensemble de haut-parleurs. Les enceintes acoustiques et ensembles de HP GRUNDIG sont livrés d'origine avec les câbles et fiches nécessaires. Cependant, pour assurer aussi une polarité correcte pour d'autres haut-parleurs, il est conseillé d'utiliser du câble repéré. Pour les deux prises HP, la masse est représentée par le contact central, de sorte qu'il est facile de réaliser le branchement en phase de tous les haut-parleurs lors de l'installation.

Attention!
Eviter le raccordement d'enceintes acoustiques ou d'ensembles HP dont l'impédance totale est inférieure à 3 Ω par canal!

A noter:

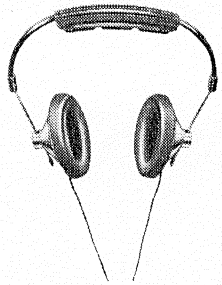
L'utilisation de câbles HP d'une certaine longueur peut provoquer des ronflements gênants, dûs à des câbles secteur hors conduit, à des rallonges ou à d'autres conducteurs secteur parallèles, notamment dans des immeubles alimentées en courant par des lignes aériennes. Pour y remédier efficacement, il est recommande de réaliser une mise à terre suffisante de l'appareil (par exemple une liaison conductrice entre la prise de terre ⏚ et la conduite d'eau ou le radiateur du chauffage central). Faire passer les câbles HP et le câble secteur loin les uns de l'autre — mais jamais par exemple dans un tube commun.

Gruppi di altoparlanti "serie LS"

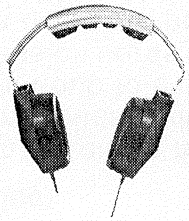
Per coloro che desiderano autocostruirsi i box necessari, sono disponibili diverse combinazioni di gruppi di altoparlanti. I box di altoparlanti e le combinazioni di gruppi di altoparlanti sono già completi di tutte le filature necessarie e delle spine relative. Per assicurare tuttavia la giusta polarità anche per altri altoparlanti, si consiglia di usare due conduttori di colore differente. In entrambe le prese per altoparlanti il polo di massa si trova nella posizione centrale per facilitare all'atto dell'installazione la messa in fase di tutti gli altoparlanti.

Attenzione! E' assolutamente da evitare il collegamento di altoparlanti o di gruppi di altoparlanti la cui impedenza totale sia inferiore a 3 Ohm per canale.

L'impiego di cavi per il collegamento di altoparlanti di una certa lunghezza può provocare dei ronzii fastidiosi dovuti all'impianto elettrico dell'ambiente fissato esteriormente sulle pareti, oppure a cavi rete di prolunga che corrono paralleli ai cavi degli altoparlanti. Per rimediare efficacemente a ciò, è raccomandabile effettuare una presa di terra sull'apparecchio ⏚ (per es. un collegamento fra la presa di terra dell'apparecchio e la conduttura dell'acqua o del radiatore del riscaldamento centrale). Inoltre far passare i cavi degli altoparlanti ed i cavi rete lontani gli uni dagli altri e mai, per es., in un tubo comune.



GRUNDIG
HiFi-Stereo-Kopfhörer
HiFi Stereo Earphone
Casque Stéréo HiFi
Cuffia Stereo HiFi
211 b

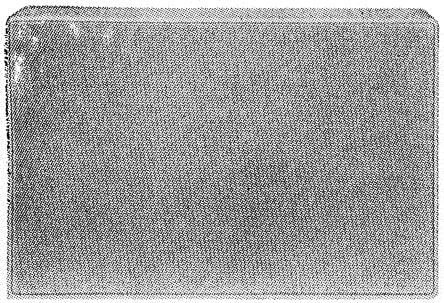


GRUNDIG
Hi-Fi-Stereo-Kopfhörer
Hi-Fi Stereo Earphone
Casque Stéréo HiFi
Cuffia Stereo HiFi
215

GRUNDIG
HiFi-Stereo-Kopfhörer
HiFi Stereo Earphone
Casque Stéréo HiFi
Cuffia Stereo HiFi
220

GRUNDIG HiFi-Box 303

3 Lautsprecher
Musik-Belastbarkeit: 35 Watt
Nenn-Belastbarkeit: 25 Watt
Nenn-Impedanz: 4 Ω
Übertragungsbereich: 50 . . . 20 000 Hz
Übernahmefrequenz: 4000 Hz
Volumen: ca. 8 Liter
Maße: ca. 51 x 34 x 9 cm
Gehäuseausführungen: nußbaumfarben oder weiß



HiFi-Box 303

HiFi-Box 303

Loudspeakers: 3
35/25 Watts
Nominal impedance: 4 Ω
Frequency range: 50 . . . 20 000 Hz
Cross-over frequency: 4000 Hz
Volume: approx. 8 liters
Dimensions: approx. 51 x 34 x 9 cm
Finish: walnut or white

HiFi-Box 303

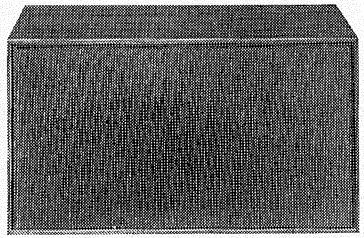
Haut-parleurs: 3
Puissance maximale admissible: 35 W
Puissance nominale admissible: 25 W
Impédance nominale: 4 Ω
Bande passante: 50 . . . 20 000 Hz
Fréquence de coupure: 4000 Hz
Volume: env. 8 litres
Dimensions: env. 51 x 34 x 9 cm
Présentation: coloris noyer ou blanc

HiFi-Box 303

Altoparlanti: 3
Potenza massima ammissibile 35 Watt
Potenza nominale ammissibile 25 Watt
Impedenza nominale: 4 Ω
Risposta in frequenza: 50 . . . 20 000 Hz
Frequenza di riferimento: 4000 Hz
Volume: ca. 8 litri
Dimensioni: ca. 51 x 34 x 9 cm
Presentazione: nei colori noce o bianco

GRUNDIG HiFi-Box 306

2 Lautsprecher
Musik-Belastbarkeit: 35 Watt
Nenn-Belastbarkeit: 25 Watt
Nenn-Impedanz: 4 Ω
Übertragungsbereich: 45 . . . 20 000 Hz
Übernahmefrequenz: 4000 Hz
Volumen: ca. 11,7 Liter
Anschlüsse: Anschlußkabel ca. 4 m lang mit Normstecker nach DIN 41 529. Buchse für GRUNDIG HiFi-Kugelstrahler
Maße: ca. 40 x 22 x 21 cm
Gehäuseausführungen: nußbaumfarben oder palisanderfarben



HiFi-Box 306

HiFi-Box 306

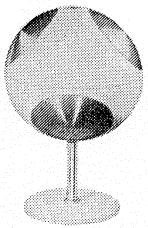
Loudspeakers: 2
Music power capacity: 35 W
Nominal power capacity: 25 W
Nominal impedance: 4 Ω
Frequency range: 45 . . . 20 000 Hz
Cross-over frequency: 4000 Hz
Volume: approx. 11.7 liters
Connections: connecting lead approx. 4 m length fitted with standard plug acc. to DIN 41529
Connecting socket for GRUNDIG HiFi omni-directional speakers
Dimensions: approx. 40 x 22 x 21 cm
Finish: walnut or rosewood look

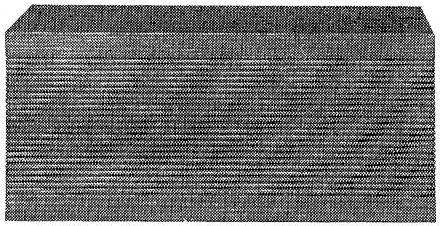
HiFi-Box 306

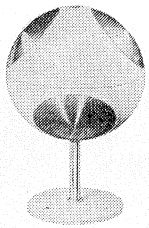
Haut-parleurs: 2
Puissance maximale admissible: 35 W
Puissace nominale admissible: 25 W
Impédance nominale: 4 Ω
Bande passante: 45 . . . 20 000 Hz
Fréquence de coupure: 4000 Hz
Volume: env. 11,7 litres
Connexions: câble de raccordement d'une longueur de 4 m avec fiche normalisée selon DIN 41 529; prise de connexion pour projecteur d'aigus HiFi GRUNDIG.
Dimensions: env. 40 x 22 x 21 cm
Présentation: coloris noyer ou palissandre

HiFi-Box 306

Altoparlanti: 2
Potenza massima ammissibile: 35 Watt
Potenza nominale ammissibile: 25 Watt
Impedenza nominale: 4 Ω
Risposta in frequenza: 45 . . . 20 000 Hz
Frequenza di riferimento: 4 000 Hz
Volume: ca. 11,7 litri
Collegamenti: cavo di collegamento lungo ca. 4 m con spina normalizzata secondo DIN 41529. Presa per irradiatore HiFi GRUNDIG
Dimensioni: ca. 40 x 22 x 21 cm
Presentazione: nei colori noce o palissandro







GRUNDIG HiFi-Kugelstrahler 300

4 Lautsprecher pro Kugel
Nur in Verbindung mit vorbereiteten GRUNDIG Boxen der 35-Watt-Klasse zu betreiben.
Anschlußkabel ca. 4 m lang mit Normstecker nach DIN 41 529.
Maße: ca. 16 cm Kugeldurchmesser;
25 cm Gesamthöhe.
Ausführungen: Kunststoff-Kugel, schwarz oder weiß.

Omni-Directional Speaker 300 HiFi

Can only be operated with appropriate GRUNDIG speaker systems of 35 W power rating
Loudspeakers: 4
Dimensions: approx. 16 cm in diameter, 25 cm total height
Connecting lead of approx. 4 m length with standard plug acc. to DIN 41 529
Finish: white or black plastic

Projecteur d'algüs 300 HiFi

Haut-parleurs: 4
Ce projecteur ne doit être utilisé qu'en liaison avec des enceintes acoustiques GRUNDIG d'une puissance de 3 W. Il est livré avec un câble de raccordement d'une longueur de 4 m muni d'une fiche normalisée selon DIN 41 529.
Dimensions: diamètre env. 16 cm, hauteur totale env. 25 cm
Présentation: en matière plastique, noir ou blanc

Irradiatore HiFi GRUNDIG 300

4 altoparlanti per sfera
Deve essere collegato con box di altoparlanti GRUNDIG della classe 35 Watt
Cavo di collegamento lungo ca. 4 m con spina normalizzata secondo DIN 41529
Dimensioni: diametro della sfera ca. 16 cm; altezza totale ca. 25 cm
Presentazione: in materiale plastico bianco o nero

GRUNDIG
HiFi-Duo-Baßbox 302 mit 2 HiFi-Kugelstrahlern

Maße: ca. 52 x 23 x 20 cm
Volumen: 2 x 6,5 Liter
Gehäuseausführungen: nußbaumfarben, palisanderfarben oder weiß

HiFi Twin Bass Speaker 302 with two HiFi Omni-Directional Speakers

Dimensions: approx. 52 x 23 x 20 cm
Volume: 2 x 6.5 liters
Cabinet: walnut or rosewood-look, white

Double HP de basses type 302 avec deux projecteurs d'aigüs HiFi

Dimensions: env. 52 x 23 x 20 cm
Volume: 2 x 6,5 litres env.
Présentation: en coloris noyer, palissandre ou blanc

Duo-Bass-Box GRUNDIG 302 con 2 irradiatori HiFi

Dimensioni: ca. 52 x 23 x 20 cm
Volume: 2 x 6,5 litri
Presentazione: nei colori noce, palissandro o bianco

Technische Daten der Duo-Baßbox 302

2 Tiefton-Lautsprecher
Musik-Belastbarkeit pro Kanal: 35 Watt
Nenn-Belastbarkeit pro Kanal: 25 Watt
Nenn-Impedanz pro Kanal: 4 Ω
Übertragungsbereich (mit Kugelstrahler)
45 . . . 20 000 Hz
Übernahmefrequenz ca. 400 Hz
Anschlüsse: Anschlußkabel festmontiert, 2 x ca. 4 m lang, mit Stecker nach DIN 41 529. Buchsen für GRUNDIG HiFi-Kugelstrahler an der Rückwand.

Common Specifications of Bass Speakers 302

Built-in loudspeakers: 2 woofers
Nominal power capacity per channel: 25 W
Peak power capacity per channel: 35 W
Frequency response (with omni-directional speaker): 45 . . . 20 000 Hz
Nominal impedance per channel: 4 Ω
Cross-over frequency: approx. 400 Hz
Connections: firmly mounted connecting lead with plug acc. to DIN 41 529, approx. 2 x 4 m long; connecting sockets for GRUNDIG Omni-Directional Speakers on rear

Caractéristiques techniques communes aux types de double HPs de basses 302

Haut-parleurs incorporés: deux HPs à tons graves
Puissance nominale admissible: 25 W par canal
Puissance maximale admissible: 35 W par canal
Bande passante (avec projecteur d'aigüs):
45 . . . 20 000 Hz
Fréquence de coupure du filtre incorporé: env. 400 Hz
Impédance nominale: 4–5 Ω
Connexions:
Câble de raccordement permanentement fixé, d'env. 2 x 4 m de longeur, avec fiche selon DIN 41 529
Prises de connexion à l'arrière pour le raccordement de deux projecteurs d'aigüs GRUNDIG.

Caratteristiche tecniche comuni per i Duo-Bass-Box 301 e 302

Altoparlanti: 2 per toni bassi
Potenza per canale: 35 Watt
Potenza nominale per canale: 25 Watt
Impedenza nominale per canale: 4 Ω
Risposta in frequenza (con gli irradiatori):
45 . . . 20 000 Hz
Frequenza di riferimento: ca. 400 Hz
Collegamenti: cavo di collegamento solidamente fissato, lungo ca. 4 m e dotato di spina secondo le norme DIN 41529. Le prese di collegamento per gli irradiatori si trovano nella parte posteriore.